HMT-West 2011 IOP 1 Summary

Overview

- IOP 1 occurred from 8 December 2010 (15Z) to 9 December 2010 (15Z).
- A total of 7 upper air soundings were launched successfully (1 balloon pop) from Lincoln, starting at 15Z on the 8th and ending at 15Z on the 9th. The soundings were launched at 4 hour intervals.
- The SkyWater radar collected data from approximately 1445Z on the 8th until approximately 21Z on the 9th.
- Liquid precipitation totals ranging from ~0.1-0.2" in the Central Valley to about 0.7" in the American River Basin (BLU).
- The event was characterized by very weak low level winds throughout the event so it is highly unlikely that there was a signature of a barrier jet.

Description

It was anticipated that IOP 1 would be a marginal event, due to the fact that the American River Basin (ARB) was forecast to be on the southern end of the significant moisture. However, given the fact that we had people already out at the radar as well as our desire to get at least one IOP completed in this La Nina pattern, it was decided to proceed with both radar and sounding operations.

The precipitation associated with this event originated with a short wave and associated low in the NE Pacific that was tapping into some sub-tropical moisture in the east Pacific (Figs 1-3).

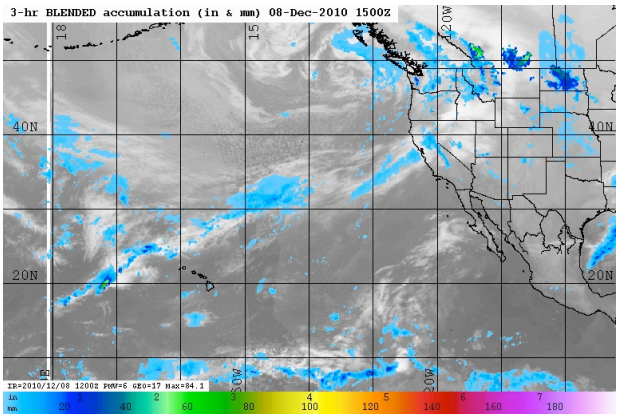

Figure 1. 3-hr precipitation accumulation at 15Z on 8 December.

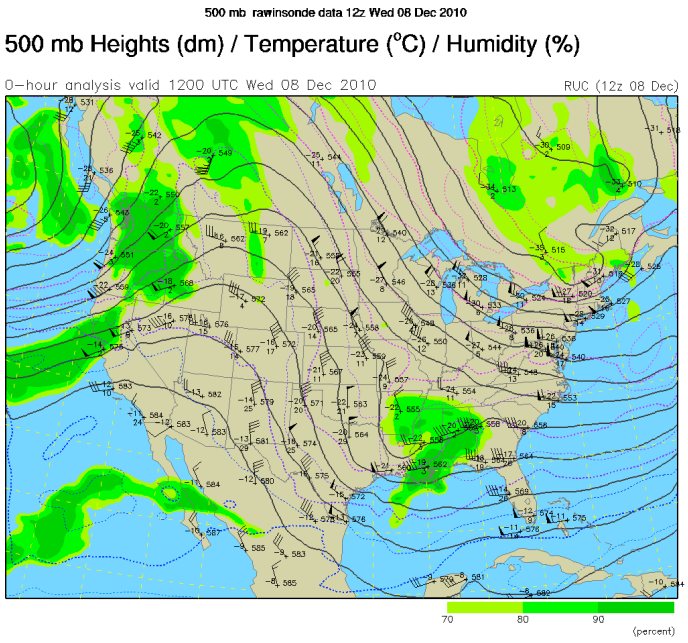

Figure 2. 500 mb flow at 12Z on 8 December.

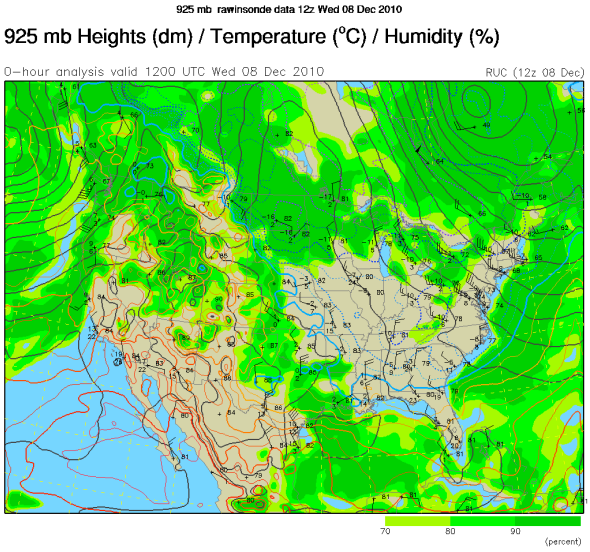

Figure 3. Same as 2 except 925 mb.

Precipitation moved into the region several hours ahead of the forecast and it was raining when SkyWater began data collection and the first sonde was launched at LHM. Figure 4 shows the extent of precipitation across the area at ~ 17UTC on 8 December. Precipitation coverage waned considerably during the afternoon and evening hours. KDAX changed their VCP mode several times during the night,

moving into clear air mode for a period time. However, by the early morning hours, precipitation had become widespread across the region (Fig. 5).

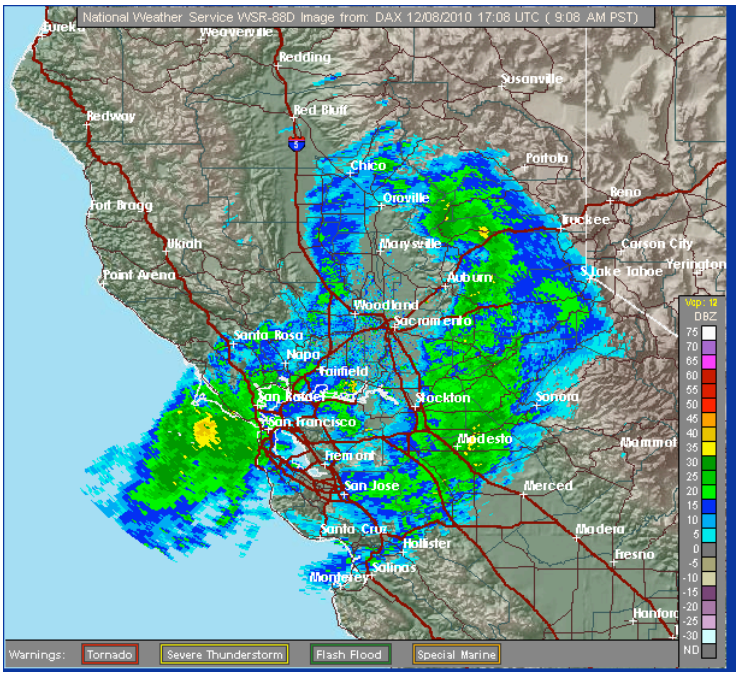

Figure 4. Low-level radar reflectivity from KDAX at 1708 UTC on 8 December.

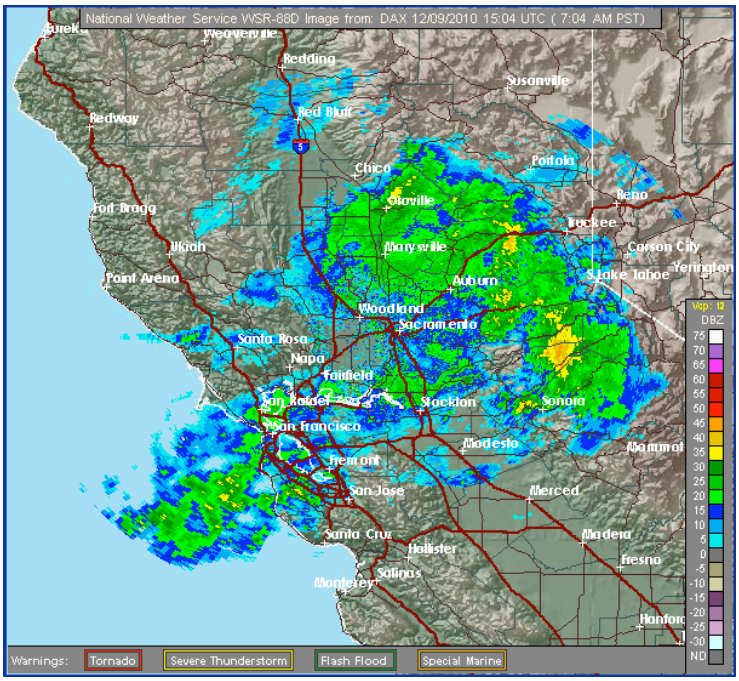

Figure 5. Same as Fig. 4, except 1504Z on 9 December.

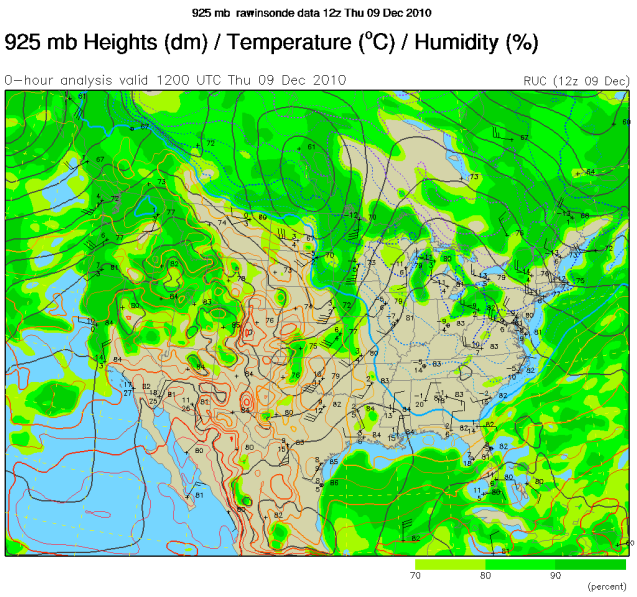

Figure 6. Same as Figure 3, except for 12Z on 9 December.

During the entire event, the low level winds were generally southerly and weak, which likely prohibited the establishment of a barrier jet along the west side of the Sierra (Fig. 7). After about 17Z, precipitation coverage decreased and became mostly scattered in the mountains. Mountain precipitation totals in the ARB were less than an inch and fell mostly as rain at most locations (Fig. 8).

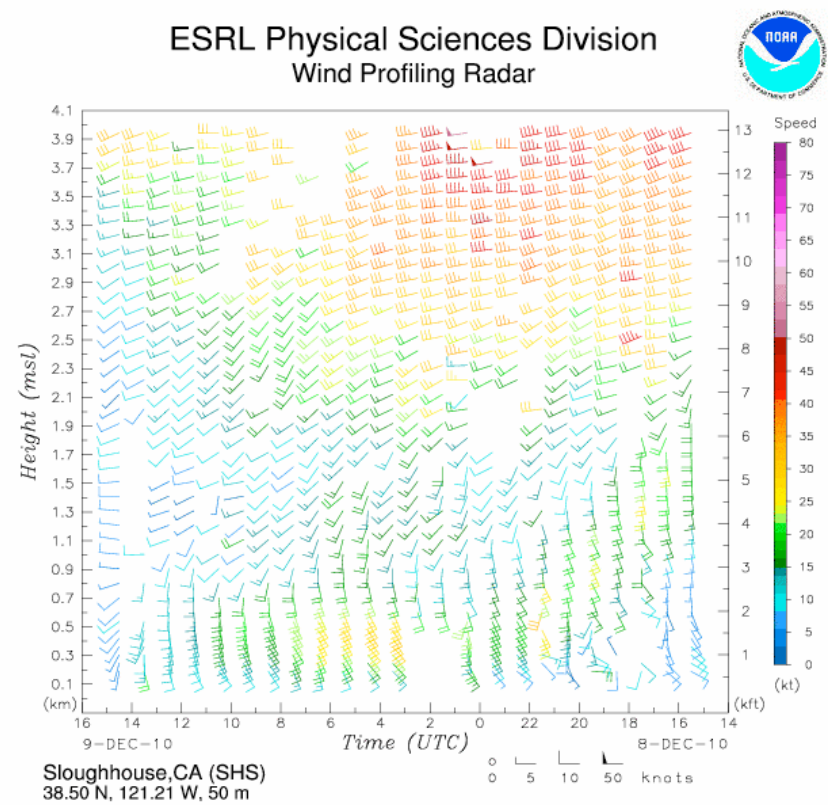

Figure 7. Time height cross sections of winds from the Sloughhouse (SHS) wind profiler. Time period is from 14Z on 8 December – 16Z on 9 December.

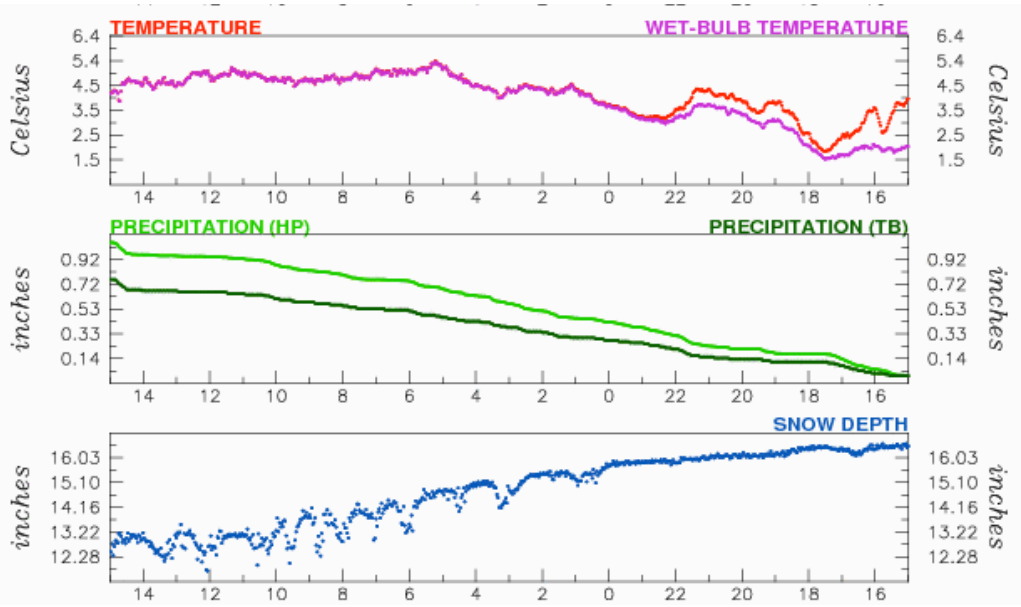

Figure 8. Time series of temperature (top), precipitation (middle) and snow depth (bottom) at Blue Canyon from 15Z on 8 December – 15Z on 9 December.